MARICOPA COUNTY DEPARTMENT OF PUBLIC HEALTH

Quarterly Epidemiologic Report

January – March 2008

INSIDE THIS ISSUE

Table of Contents

Overview of Methicillin-resistant *Staphylococcus aureus* (MRSA)

Staphylococcus aureus or "staph" bacteria are commonly carried on the skin of healthy people. It is estimated that 32% of the population carry this bacteria in their nasal passages. (1) Staph bacteria are the most common causes of skin infections in the United States. (2) Infections caused by staph can appear as pimples, boils, and abscesses; however, they are commonly mistaken for bites from insects or spiders. (2) Sometimes, the bacteria can cause more severe infections inside the body. These conditions are called invasive infections, which include pneumonia, bone infections, surgical wound infections, blood stream infections and toxic shock syndrome. (3) However, the majority of staph infections are non-invasive, and only affect the skin.

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of staph that is resistant to certain antibiotics, primarily the beta-lactams. These antibiotics include methicillin, cloxacillin, dicloxacillin, oxacillin, and nafcillin. (2,3) Overuse of antibiotics may have contributed in the development of MRSA. (3) Approximately one percent of the population carries MRSA in their nasal passages. (1) Infections caused by MRSA, for the most part, are not different from other staph infections, although some strains may be more aggressive. (3)

MRSA has traditionally been seen as associated with healthcare settings, both in hospitals and in non-hospital healthcare facilities (such as dialysis centers). Infections in these settings are referred to as healthcare-associated MRSA, or HA-MRSA. However, MRSA infections are increasingly occurring in people who have not recently been hospitalized or had a medical procedure. These infections are known as community-associated MRSA (CA-MRSA). Examples of groups that have experienced outbreaks of CA-MRSA include persons living in correctional facilities or participating on competitive sports teams. Differences between HA-MRSA and CA-MRSA are described in Table 1.

Table 1. Differences between Hospital-associated MRSA (HA-MRSA) and Community-associated MRSA (CA-MRSA).

HA – MRSA	CA – MRSA
Invasive	Skin infections
Sicker patients	Rarely invasive
Longer hospital stays	Healthy patients
Higher costs	Spread by contact
Higher mortality	Rare mortality
Est. 95,000 infections	No complete numbers for infections or deaths in AZ (MC)
Est. 19,000 deaths	

Transmission occurs via skin to skin contact and via droplets from coughing and sneezing. The bacteria may also be spread by contact with contaminated items (e.g., razors, sports equipment, towels, tattoo equipment, shared syringes) or environmental surfaces (e.g., athletic benches or mats). Factors contributing to transmission include close skin-to-skin contact, openings in the skin such as cuts and abrasions, the presence of contaminated items, crowded living conditions, and poor hygiene.

Individuals who are immune compromised and/or with interruption in the skin integrity (i.e., lacerations, abrasions, etc) are more susceptible to acquiring MRSA infections.

Incubation period for MRSA is variable, but it is typically 4 – 10 days. (1) In CA-MRSA, a person is considered contagious as long as sores are draining and are uncovered. Symptoms of HA-MRSA develop along the line of invasion, such as sepsis, pneumonia, and wound infections. In CA- MRSA, symptoms generally start as small red bumps that resemble pimples, boils or spider bites. (1) These can quickly turn into deep, painful abscesses that require surgical draining. Sometimes the bacteria remain confined to the skin but they can also burrow deep into the body, causing potentially life-threatening infections. Additionally, MRSA is also known to cause a toxin-mediated food-borne gastroenteritis. (4) A person can carry MRSA, without symptoms, for a long time before getting sick. This can make it extremely difficult to determine where a person might have acquired his or her MRSA infection. The *place of onset* of illness may have nothing to do with the *place where the bacterium was acquired*.

Epidemiology and Surveillance of MRSA

Nationally

Currently, MRSA is not a nationally reportable disease; it is reportable in Arizona according to the Arizona Administrative Code R9-6-202, 301. (6) However, national surveillance for MRSA is currently under development at the Centers of Disease Control and Prevention (CDC).

Annually, there are approximately 292,000 hospitalizations with diagnosis of *S.aureus* infection. Of these, approximately 126,000 hospitalizations are related to MRSA (43%). From 2001 through 2003, each year there were an estimated 12 million outpatient (i.e. physician offices, emergency and outpatient departments) healthcare visits for suspected *S.aureus* skin and soft tissue infections in the U.S. Invasive MRSA infections occur in approximately 94,000 persons each year and are associated with approximately 19,000 deaths. Of these infections, about 86% are HA-MRSA, and 14% are CA-MRSA. (4) The proportion of healthcare-associated staphylococcal infections that are due to MRSA has been increasing in the US, from 2% in 1974 to 64% in 2004. (5)

Maricopa County

Sterile isolates (Table 2) of MRSA became reportable by laboratories in Arizona in October 2004. For surveillance purposes, the confirmation of a case requires laboratory testing from sterile sites only. Since 2002, there have been 2,928 cases of confirmed, probable and suspected cases of MRSA in Maricopa County.

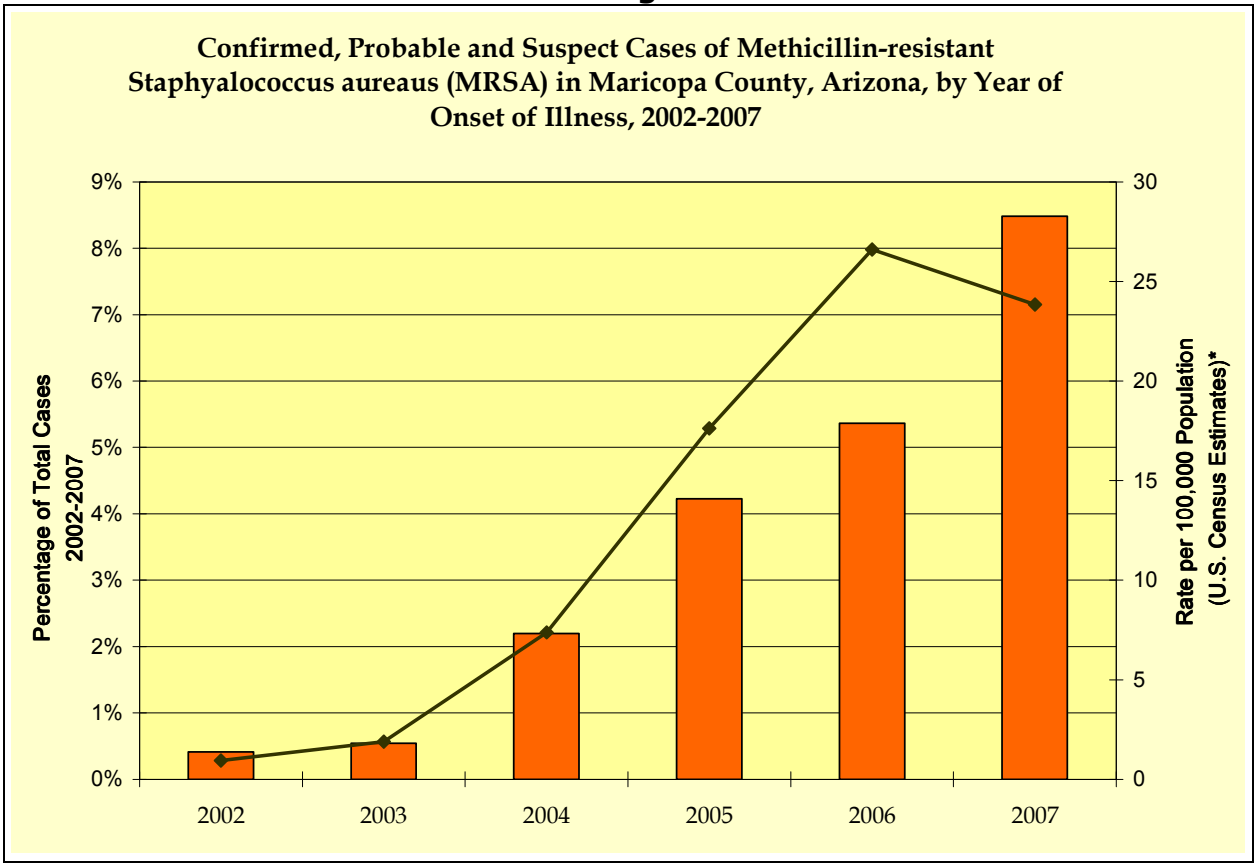
Table 2. List of Sterile Site for MRSA lab testing.

•Blood	•Bone
•Cerebrospinal fluid	•Liver
•Pleural Fluid	•Spleen
•Pericardial Fluid	•Vitreous Fluid
•Peritoneal Fluid	•Kidney
•Joint Fluid	•Pancreas or Ovary

Majority (80%) of the cases are reports of MRSA from a sterile site. From 2002 to 2007, the rate of MRSA has increased significantly in our population. For instance, the rate in 2007 was 23.84 per 100,000 persons, a dramatic increase from 2002, which was less than one per 100,000 persons (Figure 1). This high rate or incidence in recent

years can be attributed to both an increase in the prevalence of this disease in the population, as well as, an increase in the lab reporting. The percentage of MRSA infections remains constant throughout the year without an apparent seasonal pattern. MRSA infections are generally more prevalent in the population over the ages of 35 (Figure 2). Case investigations are limited to CA-MRSA outbreaks in Maricopa County. These included outbreaks in school settings and occupation settings.

Figure 1



Prevention

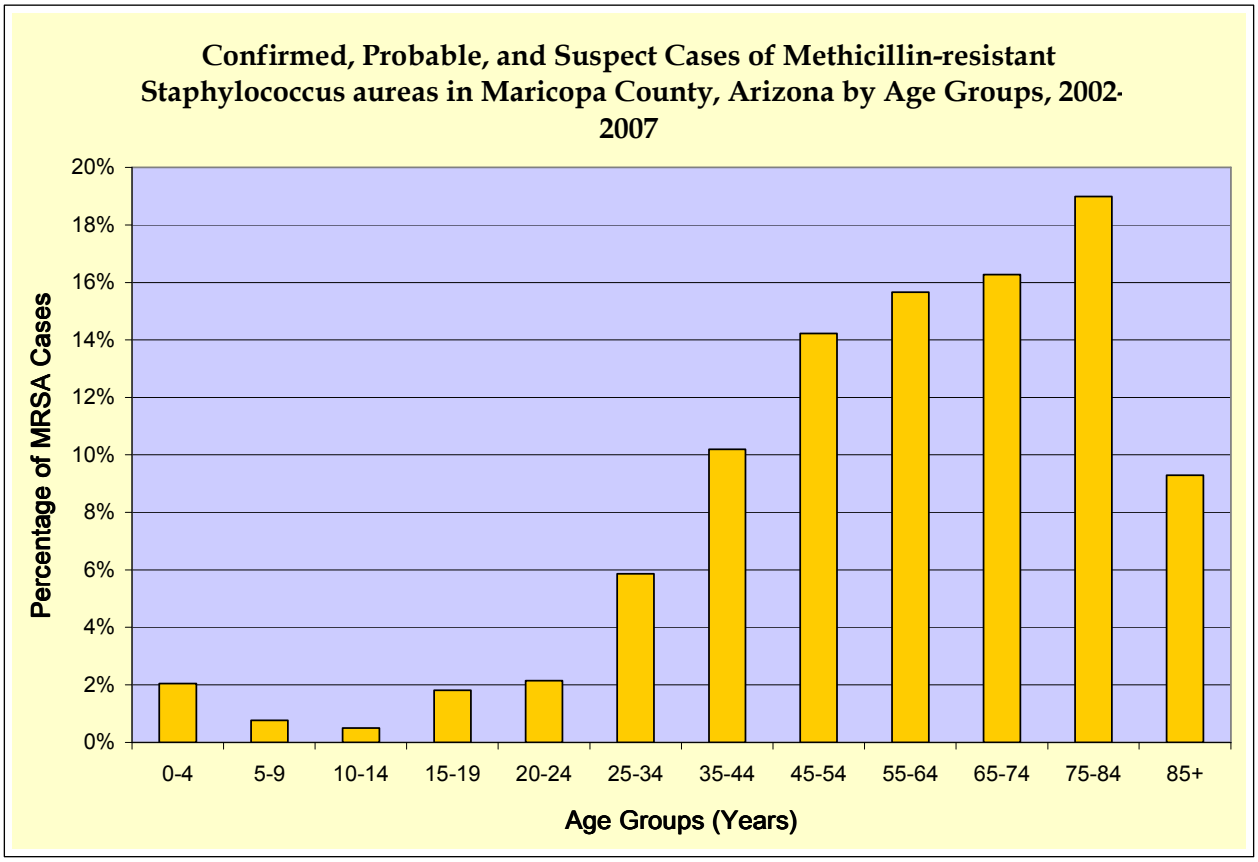
Vaccination

Currently, there is no vaccination available for MRSA.

Chemoprophylaxis

Most minor skin infections (such as pimples and boils) can be treated through proper wound care and dressings. Additional actions are needed for wounds that are not healing properly or that have excessive drainage. More serious infections (such as surgical wound infections, bloodstream infections, pneumonia) need to be treated aggressively. This may require hospitalization and/or the use of intravenous (IV) antibiotics. Laboratory testing of the organism is often necessary in order to determine appropriate antibiotic for treatment. (5) Laboratory evaluation should include culture and sensitivity (C & S) testing.

Figure 2



Preventing Infections

Personal hygiene measures, environmental hygiene measures and administration of appropriate antibiotics are ways to prevent MRSA infections in both healthcare and community

settings. Examples of personal hygiene measures include frequent and thorough hand washing, not sharing personal items, and proper wound care. Wash soiled sheets, towels, and clothes with warm/hot water and laundry detergent and dry clothes in a hot dryer, rather than air-drying, which helps to kill bacteria in clothes. For environmental hygiene measures, maintain clean sanitary conditions. Clean equipments such as athletic benches and mats with appropriate disinfectants or sanitizers before and after use. (4)

Contact isolation is recommended to prevent further spread in both childcare and healthcare facilities. Questions or concerns about isolation can be referred to Maricopa County Department of Public Health at 602-747-7111.

References

1. Centers for Disease Control and Prevention. S. aureus and MRSA Surveillance Summary 20071/CDC Infection Control in Healthcare. Http://www.cdc.gov/ncidod/dhqp/ar_mrsa_surveillance FS.html.
2. Klevens et al (2007), "Invasive Methicillin-Resistant Staphylococcus aureus Infections in the United States". *JAMA*. Retrieved on 2007-10-31.
3. Centers for Disease Control and Prevention (October 17, 2007), "MRSA: Methicillin-resistant Staphylococcus aureus in Healthcare Settings
4. CDC (1998). Guidelines for Infection Control in Health Care Personnel, 1998. Centers for Disease Control and Prevention. Retrieved on December 18, 2007.
5. Schito GC (2006). "The importance of the development of antibiotic resistance in *Staphylococcus aureus*". *Clin Microbiol Infect* **12 Suppl 1**: 3–8. PMID 16445718
6. Arizona Secretary of State. Administrative Code 2008: http://www.azsos.gov/PUBLIC%5FSERVICES/

Additional MRSA information can be found at www.azdhs.gov/phs/oids/epi/disease/mrsa/mrsa_g.htm

Please Report all suspected rabies cases and all animal bites!

For Rabies Risk Assessment and to Report Suspected Rabies Case:

(M-F 8AM–5PM)……602-506-6767
(Holidays & After hours)……602-747-7111

For Animal Bite Reporting to Maricopa County Animal Care and Control:

(M-F 8AM– 5PM)……602-506-7387
(Holidays & After hours)……...602-506-7387

Maricopa County

2008 WEST NILE VIRUS SEASON HAS BEGUN

West Nile Virus (WNV) season is upon us already. Maricopa County Department of Public Health requests to report all cases of WNV disease either to public health department at 602-506-6767 during business hours (8am – 5pm) or to 24/7 Disease Reporting Line at 602-747-7111

Health care providers should strongly consider testing for WNV or other Arboviral diseases like St. Louis encephalitis (SLE) when patients fit the following profile:

- **Viral encephalitis**
- **Aseptic/viral meningitis, especially with neuroinvasive symptoms**
- **Acute flaccid paralysis or Guillain-Barre Syndrome of unknown etiology, with or without presence of viral meningitis or viral encephalitis.**
- **Fever or rash cases of unknown origin fitting WNV clinical description**

*****Reporting all suspected and confirmed cases of WNV disease is crucial in order to determine, monitor, and abate locations of potential mosquito activity.*****

IgM antibody in the serum or in the CSF using IgM antibody-capture, enzyme-linked immunosorbent assay (MAC-ELISA) is the most efficient diagnostic method for detecting WNV.

- **Serum should be collected within 8 – 14 days of illness onset**
- **CSF should be collected within 8 days of illness onset using**

***** Positive IgG alone is not diagnostic for WNV illness! *****

Please Note: Providers should be vigilant in reporting cases and requesting IgM ELISA sampling of serum or CSF. Specimens can be sent directly to the Arizona State Health Laboratory (ASHL), which conducts serologic testing for West Nile virus WNV and other mosquito-borne viruses like St. Louis encephalitis (SLE) (see attachments).

- For sample collection, reporting, Maricopa County Department of Public Health contact and general information about West Nile Virus:
  http://www.maricopa.gov/Public_Health/HotTopics/wnv/default.aspx

- Physician Fact Sheet for West Nile Virus disease can be found at the following site:
  http://www.cdc.gov/ncidod/dvbid/westnile/resources/fact_sheet_clinician.htm

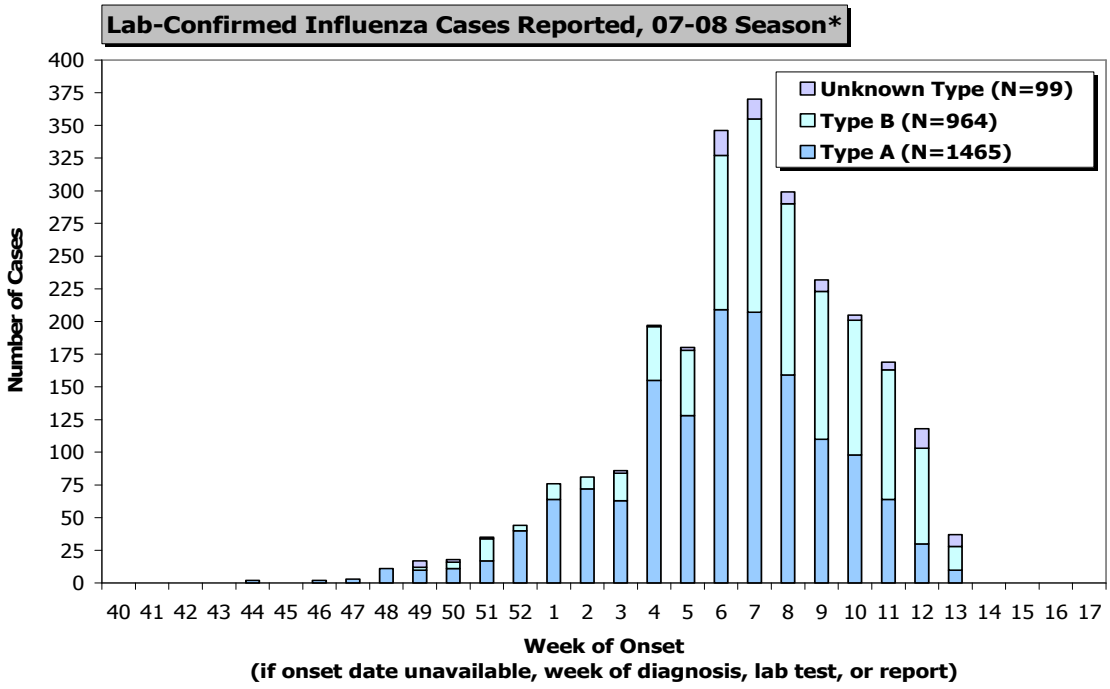
Accompanying this document please find:
- Updated Arbovirus Investigation and Reporting Form
- Pesticide Poisoning Surveillance Report Form
- Lab Submission Instruction

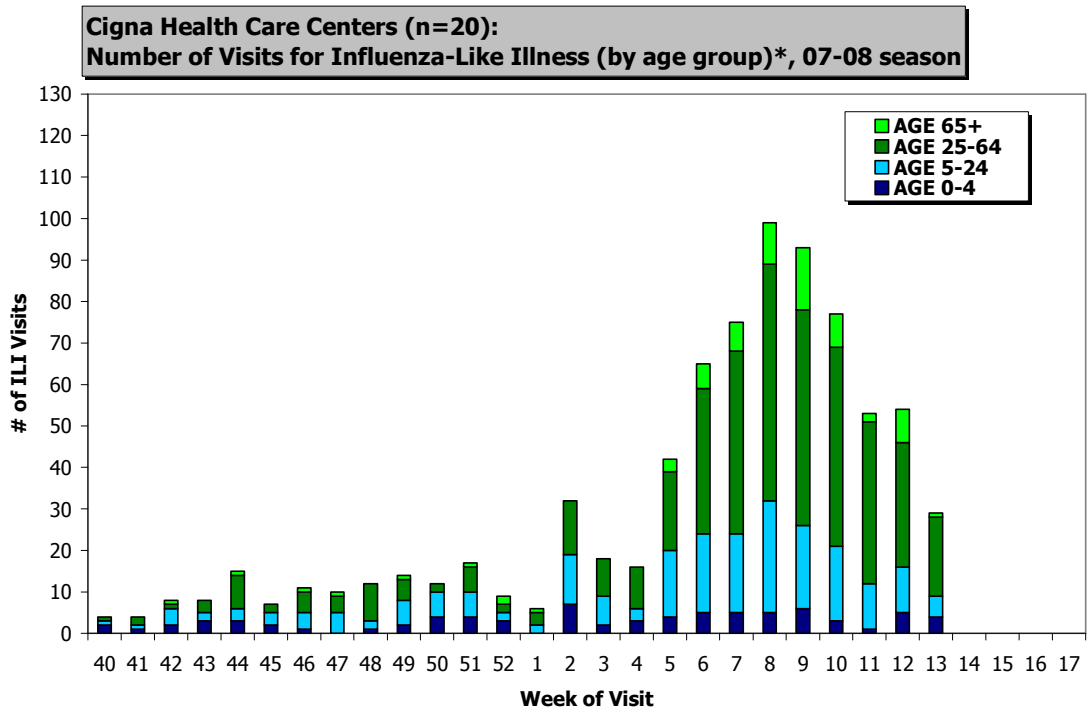
For routine disease reporting during regular business hours, call **602-506-6767**.
For disease reporting during regular business hours and after-hours, weekends and holidays call the 24/7 Disease Reporting Line at **602-747-7111**

SURVEILLANCE

During the 2007-2008 influenza season, MCDPH continues to work with local hospitals, urgent care centers, and health care centers to monitor weekly levels of influenza-like illness. Additionally, MCDPH has been collecting weekly absenteeism information from local participating schools. The following is a weekly summary of lab confirmed and ILI reports from week 40 (starting 9/30/07) through week 20 (starting 5/12/08). (http://www.maricopa.gov/Public_Health/epi/flu.aspx)

MCDPH greatly appreciates the efforts of our community surveillance partners. If you are interested in participating in the seasonal Influenza Surveillance Program, or if you have questions regarding reporting, please call or email Derek Steinke: (602) 372-2622 DerekSteinke@mail.maricopa.gov.


Lab-Confirmed Influenza Cases Reported, 07-08 Season*
Unknown Type (N=99)
Type B (N=964)
Type A (N=1465)
Number of Cases
0 25 50 75 100 125 150 175 200 225 250 275 300 325 350 375 400
40 41 42 43 44 45 46 47 48 49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Week of Onset
(if onset date unavailable, week of diagnosis, lab test, or report)


Cigna Health Care Centers (n=20):
Number of Visits for Influenza-Like Illness (by age group)*, 07-08 season
AGE 65+
AGE 25-64
AGE 5-24
AGE 0-4
# of ILI Visits
0 10 20 30 40 50 60 70 80 90 100 110 120 130
40 41 42 43 44 45 46 47 48 49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Week of Visit

Maricopa County Communicable Disease Summary Confirmed and Probable Cases Reported in 2008	
DIAGNOSIS	**FIRST QUARTER**
Amebiasis	2
Aseptic Meningitis (Viral)	93
Brucellosis	0
Campylobacteriosis	76
Cholera	0
Clostridium Difficile	0
Coccidioidomycosis	376
Creutzfeldt-Jakob Disease	0
Cryptococcosis	0
Cryptosporidiosis	5
Dengue	2
Diarrhea, Nausea, Or Vomiting	9
E. Coli	16
E. Coli O157:H7	3
Encephalitis: NOS	1
Encephalitis: Viral	0
Giardiasis	12
H. Flu Invasive Disease	23
Hemolytic Uremic Syndrome (Hus)	1
Hepatitis A	9
Hepatitis B	245
Hepatitis C	28
Hepatitis D	0
Hepatitis E	0
Influenza	240
Kawasaki Syndrome	11
Legionellosis	4
Listeriosis	0
Lyme Disease	1
Malaria	1
Meningitis: Bacterial Other	3
Meningococcal Invasive Disease	0
Mumps	1
Non-Reportable Disease	6
Pertussis	43
Q Fever	0
Rabies Exposure	0
Rash	1
Respiratory Syncytial Virus (RSV)	26
Rocky Mountain Spotted Fever	0
Salmonellosis	82
Scabies	2
Schistosomiasis	0
Shigellosis	36
Staphylococcal Infection	219
Streptococcal Group A Infection	45
(Continued)	

DIAGNOSIS	FIRST QUARTER
Streptococcal Group B Infection	12
Streptococcal Infection Other	1
Streptococcus Pneumoniae Infection	265
Taeniasis	0
Toxic Shock Syndrome	0
Typhoid Fever	1
Unexplained Death With Fever	0
VRE (Vanc Res Enterococcus)	377
Varicella	213
Vibrio Infection	0
West Nile Virus	1
Yersiniosis	0
All	**2116**

Note: This table includes *confirmed* and *probable* cases listed by CDR date, which is equivalent to the date of onset or next available date if onset date is unknown. This date may differ from ADHS data which is selected by date of report to the State.

For a complete list of reporting requirements for communicable diseases:
http://www.maricopa.gov/Public_Health/ControlPrevention/Communicable/default.aspx

MCDPH Division of Epidemiology/PHEM

Contact List (all in 602 area code)

Abrium Escarzaga	Senior Epidemiologist	372-2643
Alana Shacter	Epidemiologist	372-2636
Bob England	Medical Director, MCDPH	506-6601
Cheryl Phillips	Administrative Assistant	372-2605
Derek Steinke	Communicable Disease Investigator-Influenza	372-2622
Gary West	Statistical Programmer	372-2603
Jennifer Stewart	Epidemiologist	372-2621
Liva Nohre	Senior Epidemiologist	372-2631
Mare Schumacher	Deputy Director, Epidemiology	372-2602
Purvi Patel	Epidemiologist	372-2613
Philip Zuckerman	Surveillance Data Analyst	372-2606
Réchelle Harrion Moore	Communicable Disease Investigator	372-2618
Sarah Santana	Director, Epidemiology	372-2601
Lori Zuptich	Data Specialist	372-2614
Tammy Sylvester	Surveillance Nurse Supervisor	372-2617
Vjollca Berisha	Senior Epidemiologist	372-2611
Amy Prestanski	Epidemiologist	372-2625

To report communicable diseases, unusual health occurrences, and public health emergencies (all 602 area codes)

	Business Hours M-F 8a—5 p	**After 5p**
Animal bite reports	506-7387	506-7387
Communicable diseases	506-6767	747-7111
Death certificates	506-6805	450-9982 (pager)
Funeral homes, human remains (pager)		229-9315
HIV (reports)	506-6426	Next business day
Public health emergencies	747-7111	747-7111
Rabies	747-7111	747-7111
STDs (other than HIV)	506-1687	Next business day
TB	506-5065 or 372-1408	747-7111
WNV Hotline	506-0700	506-0700